UNITED STATES PATENT AND TRADEMARK OFFICE

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09/839,097	04/20/2001	Ashish Verma	JP920000446US1	1738

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EXAMINER
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ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 08/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _21 November 2002_ .

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-13_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-13_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _20 April 2001_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "100" has been used to designate both of the weight computation steps in Figure 2. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

On page 4, lines 4-9 and page 5, lines 21-24, the format of the paragraph containing the equations is incorrect. It is suggested that Applicant re-format these sections to insure that the printed format of the application is correct.

The specification is also objected to because it defines variables "i", "j", and "k" as both singular values of, and groups of, classifiers, samples, and classes, respectfully. It is conventional to define a group of values with a particular variable and singular values pertaining to the group as the variable with a corresponding subscripted index.

Appropriate correction is required.

Claim Objections

3. Claims 3, 4, 10, and 11 are objected to because of the following informalities:

In claims 3 and 10, "L_{ij} is of the log-likelihoods" should be re-worded as

something similar to ---L_{ij} is defined by the log-likelihoods---.

In claims 4 and 11, "where L_{ijk}s form order statistic" should be ---wherein the

values of L_{ijk} form an order statistic---.

In claims 4 and 11, "and $a_1 = 1$, $a_2 = -1$ and all other a_is=0" should be ---and $a_1 =$

1, $a_2 = -1$ and all other values of $a_i = 0$---.

In claim 9, "an L-static" should be ---an L-statistic---.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

5. Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

Claims 1, 7 and 8 are considered vague and indefinite because they define the

variable "k" as both "a number of predetermined classes" as well as "that respective

class." It is unclear to one having ordinary skill in the art how one variable can be

defined as both a singular value and a group of values.

Claims 1 and 7 are rejected under 35 U.S.C. 112, second paragraph, because in

the limitation, "designating the sample j as belonging to the class k which has an

associated weighted summation of likelihoods CL_{jk} which is greatest in value" it is

unclear whether the weighted summation is associated with j or k. Further, in this

limitation, it is unclear to what is meant by "which is greatest in value." It can be

understood that CL_{jk} is to be compared to determine if it is the greatest, but it is

unclear to what value CL_{jk} is being compared.

Claims 2 and 9 are considered vague and indefinite because of the confusing

language, "metric of relative confidence L_{ij}, metric of relative which is calculated."

Claims 2 and 9 are also rejected under 35 U.S.C. 112, second paragraph, because

they define "i" as "a particular classifier" while parent claims 1 and 8 define "i" as "a

plurality of classifiers". Similarly, claims 3 and 10 then define "i" as "classifiers"

while, as noted above, parent claims 2 and 9 define "i" as "a particular classifier"

Claims 5 and 12 are considered vague and indefinite because they recite, "the

weight w_i derived from the metric of relative confidence" with no previous mention of

any "weight w_i" in the respective parent claims.

Claims 5 and 12 are considered vague and indefinite because they define "L_{ij}"

as a "sample confidence" while parent claims 2 and 9 define "L_{ij}" as a "relative

confidence." Further, the limitation "wherein the weight w_i derived from the metric of

relative confidence is calculated as a function of (a) sample confidence L_{ij}, equal to

the L-statistic L_{ij}", is confusing because it refers to three separate values (relative

confidence, sample confidence, and the L-statistic) which are all defined by the

same variable "L_{ij}".

Claims 5 and 12 also define "j" as "a plurality of samples" while parent claims 1

and 8 define "j" as "a sample". Similarly, claims 6 and 13 define "j" as "each sample"

while, as noted above, parent claims 5 and 12 define "j" as "a plurality of samples"

Claim 8 is considered vague and indefinite because it includes the unclear

language "and for designating calculating".

Claim 10 is considered vague and indefinite because it refers to "the L-statistic

L_{ij}" while parent claim 9 calculates an L-stat[istic] L_{ik}"

Claims 4, 6, 11, and 13 are rejected under 35 U.S.C. 112, second paragraph,

because they incorporate the lack of clarity present in their respective parent claims.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7.   Claims 1-13 are rejected under 35 U.S.C. 101 because the claimed

invention lacks patentable practical application.

Apart from the utility requirement of 35 U.S.C. 101, usefulness under the patent

eligibility standard requires significant functionality to be present to satisfy the useful

result aspect of the practical application requirement. See Arrhythmia, 958 F.2d at

1057, 22 USPQ2d at 1036. The mere fact that the claim may satisfy the utility

requirement of 35 U.S.C. 101 does not mean that a useful result is achieved under

the practical application requirement. The claimed invention as a whole must

produce a "useful, concrete and tangible" result to have a practical application. A

process that consists solely of the manipulation of an abstract idea is not concrete or

tangible. See In re Warmerdam, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed.

Cir. 1994). See also Schrader, 22 F.3d at 295, 30 USPQ2d at 1459.

Although the application discloses the intended use of the invention for

"classification applications such as, for example, medical imaging, biometric

verification, signature or fingerprint recognition, robot vision, speech recognition,

image retrieval, expert systems, etc.," the claimed invention supplies the method in

terms of abstract ideas and fails to provide a concrete and tangible result. Claims 1,

7, and 8 describe a method/code/apparatus for "deciding how to classify a sample in

one of a number of predetermined classes." The claimed invention never describes

a "real world" method of using the results of the mathematical process. The claimed

result is described as associating an undefined sample with an undefined class, and

does not physically use the result for any purpose. These problems suggest that the

method of the current invention is abstract data manipulation that does not produce

a useful, tangible, and concrete result in its current form.

Furthermore, claim 1 provides "[a] method suitable for deciding how to classify a

sample." It has been held that the recitation that an element is "capable of"

performing a function is not a positive limitation but only requires the ability to so

perform and therefore does not constitute a limitation in any patentable sense. (See

In re Hutchison, 69 USPQ 138).

Claims 2-6 and 9-13 are rejected under 35 U.S.C. 101 because they incorporate,

and fail to correct, the lack of practical application present in parent claims 1, 7, and

8.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 7, and 8, as best understood, are rejected under 35 U.S.C. 103(a) as

being unpatentable over U.S. Patent No. 6,539,353 to Jiang et al.

Jiang discloses a method for performing confidence measures using sub-word-

dependent weighting of sub-word confidence scores for robust speech recognition

comprising associating a weight (i.e. a and/or b) with each of a plurality classifiers,

U_i, which are class identifiers (i.e. models) for how to classify a speech sample in

one of a number of predetermined classes (column 6, lines 3-5 and 13-23). Jiang

discloses calculating, for each of the predetermined classes, a weighted

summation/confidence summation (i.e. the summation of $f_{class}(U_i)(x_i)$), and a

cumulative mean of the weighted summation, $CS(w)$, across the classifiers, U_i, of the

log likelihood, x_i, that the speech sample belongs to that respective class (i.e. ratio between the speech sample value and a model speech sample value for that class) weighted by the weight, a and/or b (column 5, line 53 to column 6, line 1). Jiang then teaches designating the speech sample as being correct (i.e. successfully fitting into one of the predetermined classes (column 6, lines 18-23)) if its associated weighted summation of likelihoods, and the associated cumulative mean of the summation of likelihoods, CS(w), is above a predetermined threshold (column 6, lines 38-44). Further, since CS(w) is an cumulative mean of the confidence levels of the speech samples over time, it is considered inherent that the cumulative mean is successively updated with the sample confidence since the cumulative mean summation is the summation of each new confidence level obtained.

Jiang also discloses performing the method using an input means to receive data (column 3, lines 3-12) and a processor means, with associated code stored on a computer readable medium, for executing the processing (column 2, lines 30-35 and 44-56).

Although the invention of Jiang doesn't specifically disclose determining if the weighted summation of likelihoods is greatest in value, it would have been obvious to one having ordinary skill in the art to include this comparison, because Jiang does disclose a functionally equivalent method for determining the correct class for a speech sample by defining a threshold indicating a low level that the weighted summation must exceed in order to contain a high enough confidence, and the combination would have provided a similar method with more detailed results that

allowed for the user to obtain a plurality of quantitative summation results thereby

presenting to the user not only what class the sample belongs to, but also what

classes the sample is similar to, offering comparisons between samples.

10. Claims 2-6 and 9-13, as best understood, are rejected under 35 U.S.C. 103(a)

as being unpatentable over Jiang in view of U.S. Patent No. 5,880,767 to Liu.

As noted above, the invention of Jiang teaches many of the features of the

claimed invention including calculating a metric of relative confidence as a weighted

summation, and a corresponding running average, over a plurality of log-likelihoods,

but doesn't specifically provide that the weighting is derived from an L-statistic,

defined as a linear combination of an order statistic with coefficients of $a_1 = 1$, $a_2 = -$

1, and all other a_i's = 0.   ·

Lui teaches a perceptual image resolution enhancement system for processing

and sharpening various types of images by filtering the input image to extract a

plurality of components (column 1, lines 41-56) and classifying the data for adaptive

sharpening of the image (column 2, lines 17-28) wherein the filtering is carried out

using an nonlinear order static filter (i.e. L-filter) for weighting the components as a

sum of the defined coefficients multiplied by ascendingly/descendingly ordered data

(column 5, lines 10-25).

It would have been obvious to one having ordinary skill in the art to modify the

invention of Jiang to provide that the weighting is derived from an L-statistic, defined

as a linear combination of an order statistic, as taught by Liu, because Liu suggests

that the combination would have provided a method for calculating the weighting

values disclosed by Jiang, that, as suggested by the equation, allows the user to

control the accuracy of the weighting through the application of the highest weight to

the most important values during each use of the filter by first defining the filter with

the highest weights as the first coefficients and then ordering the values so that the

most important values correspond to these first coefficients (column 5, lines 10-25).

With respect to the limitation requiring that the coefficients be $a_1 = 1$, $a_2 = -1$, and

all other a_i's = 0, Applicant fails to provide a criticality for these specific coefficients

and further describes, on page 6, lines 12-16, that the coefficients in the instant

application were chosen to simplify the equation by using an L-statistic that only

provides a difference between the first and second choices that are most likely.

Since the invention of Lui also provides coefficients for the first two terms, and 0 for

the rest of the terms, the invention of Lui also only provides a difference between the

first and second choices that are most likely and therefore meets the claimed

limitations.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to

Applicant's disclosure:

U.S. Patent No. 5,469,216 to Takahashi et al. teaches an apparatus and method

for processing a digital video signal to produce interpolated data by supplying a

weight for each of a plurality of classes and performing linear combination to determine the class prediction.

U.S. Patent No. 5,708,693 to Aach et al. teaches image processing for noise reduction including the user of L-statistic filtering.

U.S. Patent No. 6,122,016 to De Haan et al. teaches video signal processing including order statistic filtering.

U.S. Patent No. 5,768,420 to Brown et al. teaches a method and apparatus for handwriting recognition using invariant features by computing a weighted summation of binned data.

Meguro et al., "Adaptive Weighted Median Filters by Using Fuzzy Techniques" teaches nonlinear filters for restoring images degraded by noise including weighted mean filters that associates weights for a particular window position and calculates the weights with an ordered summation.

Taguchi et al., "Adaptive L-filters Based on Fuzzy Rules" teaches a method for reducing non-stationary or mixed noises in an input signal by providing 5 different classes and performing a weighted summation using an L-filter.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (703)308-1309. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Marc S. Hoff can be reached on (703)308-1677. The fax phone

numbers for the organization where this application or proceeding is assigned are

(703)308-7382 for regular communications and (703)308-7382 for After Final

communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is

(703)308-0956.

jrw
August 7, 2003

MARC S. HOFF
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